CODEFORCES β
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Orange Labs Egypt Internship 2016 - Warm up Contest

A. Solve Equation

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

Given an equation with one unknown variable x, find the value of x that satisfies the equation. The equation will be one of three forms:

- x + number1 = number2
- number1 + x = number2
- number1 + number2 = x

Input
string representing the equation. It'll contain characters '+', 'x', '=', two integers (number1 & number2) and all will be separated using spaces.

(- 1000 ≤ number1, number2 ≤ 1000)

Output
The value of x.

Examples

input
x + 5 = 9
output
4

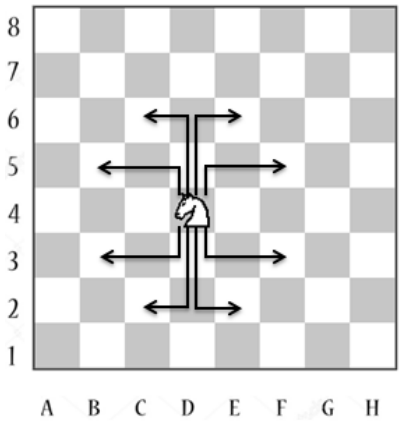
input
5 + x = 9
output
4

input
-3 + -2 = x
output
-5

B. Power of Knight

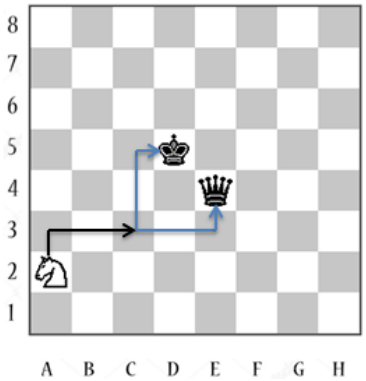
time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

Knight is a very powerful piece in chess. The first picture explains all possible moves of a knight. If a knight is at 4D it can move to (2C - 2E - 3B - 3F - 5B - 5F - 6C - 6E).



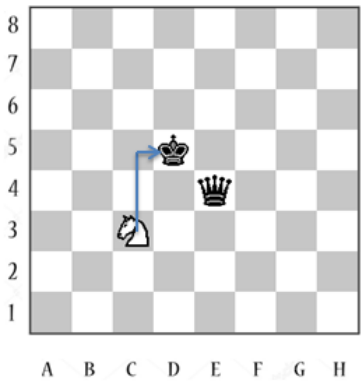
A famous strategy to eat the opponent's queen (وزير) is to place your knight such that it has the chance to eat both the opponent's king (ملك) and queen in the next move. Since that's a checkmate (كش ملك), the opponent must move the king in this turn. And in the next turn you'll eat the queen.

For example, in the second picture, you could move the knight to 3C threatening black king and its queen. Then the black king will have to move. For example, let's say the king moved to 5E. So, finally the knight will move to 4E, eating black queen.



It's your turn now. Given the positions of your knight and of the opponent's queen and king, find out if there exists a possible move for the knight that threatens both the queen and king.

It's guaranteed that the given positions will be valid. For example, third picture's positions are invalid because it's your turn and the knight can kill opponent's king in the current move.



Input
8 lines each line contains 8 characters. ('K' for black king cell, 'Q' for black queen cell, 'N' for white knight cell and '.' for empty cell). It's guaranteed that there'll be exactly one 'K', one 'Q', and one 'N'.

Output
If there exists a position to go to using the current move that allows the knight to threaten the king and queen print "YES" (without quotes) then position of the cell to go to. Otherwise print "NO" (without quotes).

Example

input
....K.... ....Q... .... N....... ....
output
YES 3C

Note
Please note that there won't be given position where knight can kill opponent's queen at the current move.

C. Find Maximums

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

Given an array and an integer k, find the maximum for each contiguous sub-array of size k.

Input

The first line of the input contains two integers n — the size of the array ($1 \le n \le 1000$) and k ($1 \le k \le n$).

The second line of the input contains n integers $a_1, a_2, ..., a_n$, ($1 \le a_i \le 1000$) where a_i is equal to the element at the i-th position.

Output

print the output array.

Example

input
6 3 8 4 8 2 3 7
output
8 8 8 7

D. Find Maximums II

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Given an array and an integer k, find the maximum for each contiguous sub-array of size k.

Input

The first line of the input contains two integers n — the size of the array ($1 \le n \le 1000000$) and k ($1 \le k \le n$).

The second line of the input contains n integers $a_1, a_2, ..., a_n$, ($1 \le a_i \le 1000000$) where a_i is equal to the element at the i-th position.

Output

print the output array.

Example

input
6 3 8 4 8 2 3 7
output
8 8 8 7

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